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RADIUM

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VOL. X DECEMBER, 1917 No. 3

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A MONTHLY JOURNAL DEVOTED TO THE CHEMISTRY PHYSICS AND THERAPEUTICS OF RADIUM AND RADIO-ACTIVE SUBSTANCES

RADIUM

A MONTHLY JOURNAL DEVOTED TO THE CHEMISTRY, PHYSICS AND THERAPEUTICS OF RADIUM AND RADIO-ACTIVE SUBSTANCES.

Edited and Published by Charles H. Viol, Ph. D., and William H. Cameron, M. D. with the assistance of collaborators working in the fields of Radiochemistry, Radioactivity and Radiumtherapy.

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VOL. X DECEMBER, 1917 No. 3

REVIEWS AND ABSTRACTS

W. H. B. Aikins, M. D. (Toronto.) The Established Value of Radium as a Therapeutic Agent. The Canadian Practitioner and Review, June, 1917. Presidential Address read at the Second Annual Meeting of the American Radium Society, New York, June 4th, 1917.

—"During the past decade considerable advances have been made in the study of the therapeutics of radium and the use of the rays has been extended with varying success to a great variety of conditions, some belonging to the domain of surgery, and others to the province of internal medicine. These conditions include benign and malignant neoplasms in different parts of the body. The influence of radio-activity on the blood has also been found useful in the treatment of certain constitutional diseases. Additions are constantly being made to the already long list of conditions in which radium is proving itself a benefactor to humanity."

"An accurate estimate of the value of any physical therapeutic agent is usually not arrived at until some considerable time has elapsed since its first introduction, and radium has been no exception to this general rule. During the first few years its advocates met with a considerable amount of opposition, and their claims were received with scepticism by the more conservative members of the medical profession. This conservative attitude in regard to new remedies obviously has its drawbacks, but it undoubtedly has the corresponding advantage that it tends to check their indiscriminate use at a time when they are still more or less in the experimental stage. At the present time, however, although a certain amount of scepticism in regard to the efficacy of radium treatment still persists in some quarters, this is gradually disappearing in view of the brilliant results which it has achieved in many cases, notably in cancer of the skin, fibroid growths of the uterus,

hemorrhage of the uterus, and as a palliative in inoperable cases, and it is now generally agreed that in radium we possess a valuable adjunct to our therapeutic armoury."

"Several factors have contributed to bring radium treatment into disrepute, and to give the impression that the claims made for it by its advocates are not justified by facts. Failures more especially in the early period have often been due to the inferior quality of the preparations used, or to the fact that radium was not available in sufficient quantity. No one will deny that under certain circumstances radium has a harmful, rather than a beneficial effect, and even if given in too small doses it may stimulate the growth of cancer instead of retarding it. On the other hand, the destructive action of too large doses may result in an irreparable damage to normal structures, and has been known to cause death. That failure may be due to insufficient dosages is evidenced by the fact that many cases unsuccessfully treated by small doses of radium subsequently respond satisfactorily to larger doses."

"In view of the importance of accurate dosage and technique it is clear that, in order to obtain good results special training and prolonged experience are absolutely essential—a fact which too many people are prone to forget—and that in the hands of those who have not had an opportunity of acquiring such experience the treatment may be dangerous. In not a few cases disastrous results, which tend to discredit radium treatment, are not to be ascribed to it, but to the inexperience of the operator."

"In estimating the value of radium treatment, it should be borne in mind that its advocates do not claim that it supersedes surgery, but that it is a valuable adjunct to surgery in helping to prevent recurrences after operation, in rendering inoperable cases operable, and that it has proved itself to be one of the best palliatives we have in cases in which operation is impracticable, and in many of such cases has brought about apparent cure. This being so, it is obvious that in a large proportion of cases radium is used as a last resource, sometimes when the patients are in an almost moribund condition, and when all other measures have failed to give relief. This should therefore be taken into consideration in estimating the results."

"In such instances, even if we succeed only in alleviating the distressing symptoms and giving the patient a certain amount of comfort, the treatment will have justified itself, and radium will have accomplished what nothing else is capable of doing. The reputation of radium has too often suffered in the past, both at the hands of its friends and its enemies, exaggerated claimss as to its efficiency being on the one hand based upon brilliant results in one or two apparently hopeless cases, whilst on the other hand it has been condemned altogether for isolated failures."

The analgesic properties of the rays, their selective action on tissues in producing destruction and proliferation are discussed. A detailed discussion of the value of radium therapy in skin cancer, in metastatic nodules, cancers affecting mucous membranes, parotid tumors, brain tumors, breast carcinomas, malignant growths in the bladder and prostate, and the uterus, lymphosarcoma, bone sarcomata, nonmalignant conditions such as uterine fibroids, naevi, warts, papillomata,

keloids, lupus vulgaris, lupus erythematosus, eczema, psoriasis, cervical adenitis and various forms of uterine hemorrhage, X-ray burns of the skin, synovial lesions, vernal catarrh, lymphoid tumors, exophthalmic goitre, tuberculous sinuses and glands, give some conception of the range of radium therapy, and the value of radium as a therapeutic agent.

"This brief and incomplete summary of the work which has been done during the last few years sufficiently indicates the extraordinary development which has taken place in radio-therapy, a development which has been rendered possible by improvements in technique and our knowledge of the character of the rays, and which justifies us in the anticipation of continued progress in this direction in the future. Even in desperate and particularly moribund cases, which are hopeless from the point of view of cure, radium has in many instances added greatly to the comfort of the patient, and has proved itself one of the best palliative measures we possess."

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Frederick S. Burns, M. D., and J. Harper Blaisdell, M. D., (Boston.) The Use of Radium in the Treatment of Cutaneous Epithelioma and Keratosis Senilis. The Boston Medical and Surgical Journal, CLXXVI., pp. 774-776, May 31, 1917.

"Whatever discrepancies of opinion which exist at the present time with respect to the value of radium in systemic malignant neoplasms, there seems to be unanimity of opinion regarding its efficacy in the treatment of epithelial tumors of the skin, and to which should be properly appended keratosis senilis as a precancerous lesion."

"Since the early work of Wickham and Degrais in France, and Abbe and Simpson in this country, evidence in favor of radium treatment for skin cancer is cumulative. While it should never be the brief of the physician to avoid surgery, except when other methods warrant it, yet in a given affection and equally good results obtained, there are distinct advantages in favor of such procedure."

"The efficacy of x-ray, for example, has long been conceded, as statistics tend to prove. But here one is confronted with increasingly complicated apparatus and corresponding delicacy of technic. Accurate dosage in x-ray therapy has always been difficult to obtain and even today, with the more perfected tubes and direct methods of gauging dosage, the margin of safety is still rather narrow and demands an operator of the utmost skill."

"It is not our purpose to eulogize radium in too optimistic terms, and in general we are interested mainly in the cure of our patients by any means whatsoever. Our experience in the use of radium during the past two years, however, prompts a cordial appreciation of its ability to heal skin cancers; while its uniformity of potential, allowing accuracy of dosage, together with a fairly broad margin of safety, renders it a remedy especially adaptable to lesions of this nature. Healing is obtained with slight inconvenience to the patient; no discomfort of any moment and with cosmetic results unobtainable by any other means."

"The following case reports, taken from private practices of the writers, are illustrative of types amenable to radium treatment. The

results were obtained by one-half and one-quarter strength applicators, collectively containing eight milligrams of radium element."

"Case 1. Mr. F. B. N., aged 47. Quarter-sized epithelioma of one year's duration on the right cheek."

"Radium in a half strength applicator was applied for seven hours, divided in seven treatments of an hour each at weekly intervals. Twelve weeks after the first application the lesion was completely healed. There was no sign of a recurrence after four months."

"Case 2. Mr. A. M. C., aged 42. Dime-sized, superficial epithelioma on the concha of the left ear, of nine months' duration. A slight exposure for three hours of unscreened half strength radium applicator was sufficient to eradicate the lesion. Complete healing took place in one month."

"Case 3. Mr. S. K., aged 65. Recurrent epithelial growth, 1 by 2 cm., at the periphery of a scar of an old growth curetted some years before from the right cheek. The lesion completely healed in two months' time, after two treatments for an hour each, at four weeks' interval, with a half strength radium applicator."

"Case 4. Dr. X., aged 60. A small ulcerated epithelioma, ¾ cm. in diameter, situated on the left ala nasi. The borders of the lesion were firmly indurated. The affection was first noticed four or five years ago, as a small keratosis. It remained practically stationary until three months ago, when it began to enlarge and become a nodule."

"Radium was applied to this patent for an hour and a half, divided into two applications of three-quarters of an hour each, at weekly intervals. Quarter strength applicators were used. Complete healing ensued; the scar was slight and plastic, and there has been no recurrence after an interval of seven months."

"Case 5. Mr. G. A., aged 70. Recurrent epithelioma in cicatrix following excision and treatment by x-ray. The affection began five years ago over the left mastoid region and became an ulcerated nodule 2 by 3 cm. in diameter. Two years ago the lesion was excised but it recurred in three months."

"A total time of six hours' application of radium was made to this lesion, divided into three exposures. Quarter strength applicators were used with a screen of .5 of aluminum. Healing was complete in two months. The cicatrix is still sound with no evidence of relapse after seven months."

"Case 6. Mr. G. E., aged 79. Epithelioma over right malar prominence, 3x3 cm. in diameter. The lesion was mainly ulcerative, but there was also a characteristic indurated periphery. There were also several small keratoses on various parts of the face which were also removed by radium. This epithelioma was given a total dosage of seven hours, unscreened, each exposure lasting from one to two hours. Some time was needed in this case to remove a deep nodule at the upper part of the lesion. The patient is still coming for treatment of a keratosis on one side of the neck. The scar at the site of the recent epithelioma is observed to be sound."

"Case 7. Miss R., aged 40. Two small nodules, ¼ cm. in diameter, near the muco-cutaneous border on the left lower lid. The affection had been noticed for about six months. The nodules disappeared following three hours' radium application. Light screening with aluminum foil and ¼-strength applicators were used."

"Case 8. Mrs. P. M., aged 78. Epithelioma of left side of lobe nose, recurrent in cicatrix. This lesion was treated by one of us with x-ray three years ago. There have been three recurrences during this period. After five hours' treatment with radium, complete healing ensued, and there is no evidence of return after a lapse of seven months."

"Case 9. Mr. J. E., aged 65. Extensive ulcerative epithelioma of the nose. The affected area is roughly quadrilateral in shape, the lateral diameter being two inches, the perpendicular diameter two and a half inches. The borders of this lesion are indurated and everted; the central portion is an ulcer."

"To this epithelioma a total exposure of eighty hours was given, divided usually into two and three-hour treatments. With the longer applications light lead screening was used."

"After four months there remain but two palpable nodules. These are at present under treatment."

"Case 10. Mrs. P., aged 68. Nodular and ulcerative area on the left side of frontal region, approximately an inch in diameter. The patient's family physician had frequently cauterized the outbreak, but it had invariably relapsed in the scar. Here was complete healing after three hours of radium."

"Case 11. Mrs. J. V., aged 65. Small nodule, ½ cm. in diameter, on the external surface of the left auricle. Complete healing occurred from four hours' exposure."

"Case 12. Miss L. R., aged 38. Epithelial nodule, occurring at the border of a pigmented nevus. Healed after three hours' exposure."

"Case 13. Mr. F., aged 55. Keratosis senilis. Several small keratoses on the external surfaces of both auricles. Each lesion was given one hour's exposure with ¼ strength applicators. Prompt healing followed."

"Case 14. Miss B. E., aged 35. Small epithelial nodule at the left inner canthus. Complete healing with three hours' exposure. Light aluminum screening was used."

"Case 15. Mr. A. J., aged 80. Epithelioma, nodular and ulcerative, on the left side of the forehead, one centimeter in diameter. Complete haling after four hours' exposure; ¼ strength applicators were used, without screening."

"Case 16. Mr. J. O., aged 58. Ulcerated nodule, ½ cm. in diameter, on left lower lid. The patient also had numerous keratoses. The nodule and also several of the more prominent keratosis were healed with five hours' exposure."

"Case 17. Miss W., aged 54. Two small keratoses, one on either side of the nose. Each lesion healed after exposure of one-half hour, without screening."

"Case 18. Mrs. M., aged 56. Three small keratoses, one on the nose, the others on the left cheek. Complete healing after two exposures of one-half hour each."

"Case 19. Mr. L. P., aged 60. A business man presented a dime-sized, simple keratosis senilis upon the left malar eminence. Radium, in a half-strength applicator, was applied for twenty minutes, without screening. Reaction to the extent of redness and the formation of a dry crust appeared after seven days, and on subsiding about six days later, the skin appeared normal, and has remained so after a period of one year."

"Case 20. Mrs. R., aged 72. This lesion consisted of a rapidly-growing tumor, half an inch in diameter, with pearly borders and a central horn, three-eighths of an inch high, that had been present upon the upper lip for six months. Unscreened radium, in a half-strength applicator, was applied three times at weekly intervals for periods of forty-five minutes, one hour, and one hour and a quarter respectively. The projecting horn began to crumble away at once, and ten days after the last treatment considerable redness and crusting appeared as the result of the exposures. The applicator was screened with 2 mm. of brass and applied for thirty minutes. Two weeks later the reaction had entirely disappeared, leaving only a slight crust on a flat surface. Radium, with the same screening, was applied for forty-five minutes. The final scar was smooth and free from recurrence."

"Case 21. Mr. H. C., aged 70. The patient showed an epithelioma of several years' duration, upon the right side of his neck, at the collar line. The lesion was oval, an inch wide at its broadest point, and had a crusted ulcerative center and raised pearly borders. Six hours of unscreened radium, in hour exposures at weekly intervals, completely healed the lesion. Recurrence was guarded against by applying the radium with the 2 mm. brass screen for one hour every fortnight for four times."

"Case 22. Mr. R., aged 68. This patient had been troubled by a small, hard, keratotic growth in the outer fold of the right ear. Pain on pressure was so severe as to compel the patient to give up sleeping on the affected side. A single twenty-minute application of unscreened radium, in a half-strength applicator, was sufficient to relieve the pain after a few days. Two further twenty-minute treatments entirely removed the keratosis."

"Radium effectively heals *epithelioma* and *keratosis senilis*. The cosmetic results following its use are excellent. An especial field of usefulness is about the nose and eyelids, where surgery is difficult and the results deforming. An advantage over x-ray therapy is the accuracy of dosage and the greater margin of safety."

* * * * *

Russell H. Boggs, M. D., (Pittsburgh, Pa.) Carcinoma of the Uterus Treated by a Combination of Radium and Roentgen Rays. The American Journal of Roentgenology, IV. pp. 207-210, May, 1917. Read at the Seventeenth Annual Meeting of the American Roentgen Ray Society, Chicago, Ill., Sept. 27-30, 1916.

"The large amount of clinical data collected has proved certain well established facts in the treatment of carcinoma by radium. Radioactive substances have been used in the treatment of malignancy for about ten years. During the first seven years the entire subject was in the experimental stage. The few who studied did not have a sufficient amount of radium and the operators were unfamiliar with the methods of screening and the value and importance of roentgen radiation as given from the outside for the purpose of destroying metastases. This was before the physicists, chemists, physiologists and clinicians had worked together and, consequently, it is only for about three years that statistics of any value whatever are available."

"There is no longer any doubt that radium and the roentgen rays exert a powerful influence over cancer cells. There have been many

thousand cases of pelvic carcinoma treated by radiotherapy, but most of these have only come in the very last stage of the disease. Even in this hopeless group a patient would occasionally get well, while nearly all received palliation. Many of these cases could have been referred sooner and the patients would have had much better chance, had the physician been familiar with the value of radium. The investigations of the so-called cancer cures have been especially difficult because of the length of time required to check the ultimate results. Radium has been lauded in the highest terms by many; abandoned by some who only witnessed the treatment of possibly a cachetic patient; and denounced by many without even a trial. At present the value of radium is being recognized by most of the gynecologists, proctologists and urologists."

"Experience of the past three years has shown that we cannot treat successfully with radium at a greater distance than two or maximum three centimeters. It has been universally accepted that cancerous growths can be promptly and also apparently permanently cured at this depth from the radium tube. However, if the disease is advanced and there is infiltration of the growth into adjacent lymphatics, the cure is only apparent. The local growth may disappear, but if metastasis takes place before treatment is given, it will progress, if radiation is effective only for two or three centimeters from the tube, without regard to the quantity of radium applied or to the length of time it is applied. Larger quantities of radium have been tried and the time of exposure increased so as to influence cancerous cells at a greater depth, but the universal reports show that not much success has been accomplished in this direction. The overlying tissues were damaged beyond recovery, regardless of the kind of filters employed. The rays of the radium in contact with the growth were too intense where it entered, and too weak at a greater distance from the tubes than two or three centimeters. Placing the radium at a distance from the surface so the rays would be nearly uniform at the point of entrance and at the distance required, renders the radiation too weak even if large amounts are employed. The same objection is not held to apply to the present roentgen tube which, when powerfully excited, gives off many thousand times more rays than any quantity of radium any one has ever used. It has been estimated that with ninety-two grams of radium it would be necessary to place the radium at the same distance in order to obtain at a depth of ten centimeters the same intensity of radiation as with the roentgen tube. By this I do not mean that it would be necessary to give the radium in five or ten minutes as we are doing at the present time with the roentgen rays."

"It has been found that radiation will destroy cancer cells at a depth of ten centimeters from the surface of the skin and that the intensity is reduced from 100 to 15, that is about one-seventh of that on the surface."

"In order to show the manner in which gynecologists are taking up the treatment of radium in uterine cancer, let me quote a paragraph from John G. Clark's paper "What do the Newer Methods of Treatment Offer the Patient with Malignant Disease of the Uterus?"

'Basing our statement upon the literature and upon our own limited experience in the use of radium, we should set down as definite postulates the following conclusions:

'(1) Up to the present there is not sufficient evidence in favor

of radium to justify one in using it as a substitute for surgical measures in operable cases.

'(2) As a forerunner to and a follower up of an operation it is unquestionably advisable.

'(3) In inoperable cases it should invariably be tried, for apparent cures have occurred in some markedly advanced cases, and in those cases that are not ultimately cured, there is nevertheless a decided amelioration of symptoms—in many instances, the offensive discharge and hemorrhage completely disappear.

'(4) A serious disadvantage in the use of radium is that it occasionally produces a widespread necrosis, leaving vesical and rectal fistulæ in the wake of its destructive action. This, however, usually occurs only in advanced cases of carcinoma, and need not, therefore, deter us from the use of the remedy.' "

"I believe that local injury to the patient will seldom occur if the proper amount and kind of filtration is used and if the dosage is adapted to the individual patient. We know that tissue will stand large doses of radium, if not too often repeated, leaving no scars or adhesions. Radiation carried to the extent of severe injury of normal tissue may defeat its own ends. The tissues can be more severely inflamed and yet make a complete recovery by radium than by any form of roentgen therapy."

"Clark's remarks could be applied to carcinoma of the rectum, bladder and prostate. Operate on every operable case, radiate all cases after operation. Some surgeons advise against operating on borderline cases because usually they can be clinically cured by radium. All advise radiating advanced cases, for an occasional cure will be obtained and some can be made operable. Radium supplemented by roentgen therapy in far advanced cases will give great palliation but a cure will not be effected. Some of these cases are clinically cured in that all visible signs of the disease will disappear, but the patient will later succumb to the deep metastases."

"The amount of radium element, the screening, the distance from the growth, the time of exposure and the nature of the tissues to be acted upon must be carefully considered when deciding upon the dosage. The law of reaction is the governing factor in its use, and success can only be attained when the radiotherapeutist is familiar with his agent and knows the exact pathology and extent of the disease. He must also know the limitations of radium and not promise a cure when nothing but palliation may be expected."

"There is a difference of opinion in regard to the technic of applying radium in uterine, rectal and vesical carcinomas. Kelly, Kroenig and others advise the use of large quantities of radium, while others advocate the use of smaller quantities, applied for a longer period. All have generally agreed that less than 50 milligrams of the element should not be employed in uterine carcinoma, as stimulation of the growth instead of destruction might occur. Pinch, of the London Radium Institute, where large quantities of radium are available, prefers to use from 50 to 100 milligrams. Bumm and many others have come to the same conclusion. What the final dosage will be decided upon to produce the best results remains to be seen, but in reviewing the literature it appears that many have decided upon doses of from 2000 to 4000 milligram hours, to be given within the first week or

ten days. The dosage must always be decided upon for each individual case. Some give this amount at one seance, while others divide it up into six or eight. The results seem to be about the same, but the condition of the patient possibly should determine what course to pursue. If used continually until a full dose is given, it is advisable to remove the radium and give a cleansing douche. The treatment is repeated in three or four weeks, according to the indications. There is also some difference of opinion in regard to screening, but all agree that at least 2 millimeters of lead or its equivalent of brass or bronze is necessary. The latter is being prepared by many, as it is claimed that bronze gives off less secondary radiation. The metallic tube is covered with sufficient rubber, gauze or other substance to cut off the undesirable secondary radiation. One millimeter of pure rubber, covered by gauze and a finger cot, answers this purpose."

"The distance of the radium from the growth is only the thickness of the filter, but this must be taken into consideration when deciding upon the length of exposure as well as the amount of radium element. During the past year some of those purchasing radium have visited me and they seemed to think all they had to do was to insert the radium. They were unfamiliar with a radium or roentgen reaction on the surface of the skin or mucous membrane, to say nothing of the deeper reaction. They would start in about the same way as a gynecologist would without knowing the principles of aseptic surgery, expecting to learn by sacrificing his patients. Roentgenologists who have had experience in therapy are much better qualified."

"I cannot too strongly advocate that radium be supplemented by the roentgen rays, feeling sure that smaller quantities applied locally with proper roentgen therapy from without are equal, if not superior, to any quantity of radium ever used up to the present time as far as the end results are concerned. Kelly uses radium at a distance of two to five inches from the surface in large quantities from without, in the same way as many are using roentgen therapy from a Coolidge tube. Whether his results are equal or superior remains to be seen. As light decreases inversely with the square of the distance, the tissue would be rayed more uniformly with the source of energy at 8 or 10 inches than 2 or 5 inches. Besides, greater areas can be treated. Although the better method of treatment still remains to be determined, I believe most of us who have treated a number of cases of fibroids will expect more from the combination of radium and the roentgen rays than from radium alone, treated by any method. As before stated, this is the method which is carried out in European clinics and many of us have witnessed their results. Besides, it is not nearly so expensive, as it does not require at least several grams of radium. In short, it seems a more practical method."

"Conclusions.—Valuable statistics are being obtained, but the time is not long enough to speak of definite cures, although several cases have been recorded over eight years ago."

"As a forerunner to, and a follower up of operation, radium is of unquestionable value. Relief of the symptoms in advanced cases is so marked that every practicing physician should at least familiarize himself with this fact."

"The offensive discharge and the hemorrhage usually completely disappear. The discharge at the beginning which is so offensive to the

family and nurses as well as to the patient usually completely disappears within two or three weeks. Almost every gynecologist who followed the treatment of these cases will state this as a most remarkable feature in his report."

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W. S. Newcomet, M. D., (Philadelphia, Pa.) The Treatment of Nevi. The American Journal of Roentgenology, IV. pp. 605-610, January, 1917. Read at the Seventeenth Annual Meeting of the American Roentgen Ray Society, Sept. 27-30, 1916.

"As the various forms of "birth-marks" calling for treatment are usually located upon the exposed portions of the body, particularly the face, treatment is expected to result not only in their eradication but also in cosmetic perfection. The great difficulty is that any method used to destroy these dilated blood vessels will to some extent destroy other cells of the surrounding tissue which, being particularly sensitive, are much more liable to undergo a retrograde change than the more resistant blood-vessels."

"The wide latitude in the dilatation and character of these vessels also enters into consideration. Moles. particularly of the hairy variety, are included in this class; and while not strictly "birth-marks" the structure of their tissue is somewhat similar. Their removal is usually accomplished by similar procedures and the same difficulties are encountered in both varieties. In moles, the vessels are surrounded by an overgrowth of other tissue that enters into the composition of the mass, and those that contain an excess of fibrous tissue will be found exceedingly resistant to any destructive process."

"The pathology of these vessels is not generally understood, but there is not the least doubt that the trophic nerves play a very active role in these structures. In the more expansive varieties, involving a whole limb or the major part of it, the overgrowth of the underlying structures may extend to the bone. It is the destruction of the nerves, coincident with that of the vessels, that lead to the disastrous result so frequently observed. Such a case, caused by the roentgen ray, has been reported before this Society and several others have come under observation. Through the courtesy of Dr. Wm. Clark, of Philadelphia, another equally disastrous result with considerable disfigurement, caused by the application of radium to a "port-wine stain," has been brought to our attention. In that instance there has been extensive destruction of the tissues of the face coupled with the formation of a large keloid which, however, Dr. Clark has been able to relieve to some extent."

"While radium has been regarded as a panacea for these angiomata, the unfortunate result referred to above was brought about by one of our most celebrated foreign radiologists and, judging from other cases that have come under observation from several sources, the perfect results following the radiation treatment of nevi have been somewhat exaggerated."

"This statement is not made in the spirit of censure. It is based on the fact that operators using any of the numerous methods for the removal of nevi, are usually satisfied with the destruction of the color without considering the fact that the color of the surrounding skin is changed under the influence of excitement, temperature changes, light, etc., while the scar tissue of the former site of the nevus is not. Under certain circumstances there may even be a rather displeasing effect due

to the difference in the vasomotor control of the vessels of the affected area and that of the surrounding normal structures."

"All birth-marks should be treated as soon after birth as may be practicable. In the first place, there is not the least doubt that they will charge rapidly in the first weeks of life, and it is a common occurrence even for the attending physician to comment upon the increase in size of a mark, the very presence of which had escaped him at the time the child was born. These facts have been verified by personal experience in a number of cases, two of which are of more than ordinary interest as the infants died, not directly as a result of the nevi tissues but from intestinal complications. The nevi in both cases were upon the face and neck, extending downward over the chest; they gradually enlarged to such an alarming degree that rupture seemed imminent. At the same time there was considerable embarrassment to respiration. In neither case did the child's condition permit of any operatic procedure upon the nevi, and this raises the interesting question: Did the nevi cause the fatal issue, or was it the poor condition of these infants, that caused the nevi to enlarge? It might also be mentioned that a rapid enlargement of nevi will occasionally happen after the application of various caustics for their removal. A second reason for the early treatment is the smaller size of the nevi in infancy, and the fact that the scar will become largely obliterated in the rapidly growing child, while the tissue change is slower in individuals of maturer age. We are often advised not to interfere with these marks, the idea being that malignancy is apt to result from any procedure to remove them. No doubt this opinion is due to the fact that malignancy is apt to become engrafted upon these areas, especially when an unsuccessful attempt at their removal has produced an excessive amount of scar tissue. There is no doubt that some of these nevi, particularly the moles, do tend to become malignant. This happened, for instance, in the case of a young woman who, several years ago, applied for treatment of a mole upon the left cheek, about the size of a ten-cent piece. CO_2 snow was applied, and in a few weeks the area healed. The result seemed to be perfect to all intents and purposes. Within a few months, however, the mole had recurred, covering a larger area and was several times thicker than before. Excision was recommended; and the wisdom of it was confirmed by the pathologic examination, which proved the growth to be a melanotic sarcoma. About a year later the patient was perfectly well."

"Many poor results can usually be attributed to lack of experience. One such instance came to my notice several years ago, a surgeon attempting to remove a very extensive "port-wine stain" upon the face with CO_2 snow. Having had no experience in this line, it is needless to remark upon the result."

"While there are cases upon which none of the known methods will produce an ideal result, the majority of the blemishes can be removed, leaving but very little evidence of the former trouble."

"Where a portion or perhaps the whole area has been treated, it has often been noted as a curious fact that, while the discoloration will not entirely disappear at first, it may after the lapse of a few months result in a perfectly normal condition. In others, some discoloration and swelling due to the trauma of the method of treatment will be observed, and it often requires the treatment of months before the parts assume a normal appearance. This is especially so after radiation."

"Selection of Methods. Surgical—The accepted surgical procedures constitute a well defined, safe and rapid method for the elimination of angiomata, but they are limited to a certain class of well defined, tumor-like masses which easily lend themselves to ligation. The diffuse varieties have been excised, the operation being followed by skin grafting. As a rule, however, such methods are not to be commended in view of the considerable scarring that is likely to follow."

"*Caustics.*—For small, more or less circumscribed areas, a number of different caustics have been recommended, but as they are apt to leave a permanent whitish scar, the result is objectionable in skins of high color. The substances most commonly in use are: nitric acid, chromic acid, trichloracetic acid, pastes of arsenic, pyrogallic acid, salicylic acid, stick caustic, zinc chlorid, and many others. Freezing with ethyl chloride, the application of CO_2 snow or liquid air is, as a rule, less painful and can be controlled to a degree quite unattainable with chemical caustics. Besides, the results are better and the remaining scar is not so liable to display that bleached, white color which often makes the scars of chemicals unsightly. In a selected number of cases where CO_2 snow was used, the results were very good, the skin having assumed the character of the surrounding parts at the end of a year. The same method failed in two other cases that came under observation, but it is interesting to note that in both these cases radium was subsequently used with success."

"*Electrical Methods.*—Galvanism is the oldest method still in use; under certain conditions the results may be good. The various forms of high frequency, desiccation, fulguration and diathermy which are now being employed depend more or less upon the same principle of producing an electrochemic change in the tissue which, in turn, produces a certain amount of tissue regeneration. The ultimate scar will closely resemble the normal tissues."

"In all these methods the personal equation of the operator must be considered, and where a high degree of skill is employed the results are often remarkably good. They are more or less painful and require the use of an anesthetic where a large area is to be treated."

"A number of selected cases have been treated with the electric needle and diathermy. Their only advantage over the other method is that the control has a wider scope. The results have been uniformly good."

"*Ultra-Violet Light.*—Cases have been observed where this method has been employed by Dr. Wm. Clark, of Philadelphia, with marked success in the milder and more wildly disseminated forms. It certainly has many points to recommend it, and the results are good. The heavier areas are subsequently treated by other methods."

"Radiation.—More than ten or twelve years ago the roentgen rays were mentioned by several authors for the relief of angiomatous conditions, but at that time it was not generally adopted, due no doubt to the lack of control and the variable susceptibility of the individual to the roentgen ray. The danger of producing a burn was too great in proportion to the result obtained, and ultimately little was heard upon the subject after the lapse of a few years. Not until the use of radium was this method broached again, and at the present moment radium is, generally speaking, usually employed. Its results have been in some instances brilliant, but it is a popular misconception of the properties of radium to suppose that its mere application will cause the angiomata

to disappear, as the results will depend directly upon the control and experience of the operator. Let it be remembered that radium has caused results as bad as the roentgen ray and that the telangiectases and keloids that follow are equally disfiguring.

"The reaction from radium closely resembles that following a roentgen radiation with a spark gap of about eight inches and a four millimeter aluminum filter. It is alarming when it occurs but it subsides earlier than the roentgen burn from a low unfiltered tube which, as a rule, begins as a mild erythema and gradually grows from bad to worse. No doubt some one in the future will work out a roentgen technic that will be perfectly safe."

"The difficulty in treating these marks with any form of radiation lies in the unevenness of their structure. It can easily be understood that the heavy areas so often surrounded by lighter areas require a different dosage; and if the whole area is treated *en masse,* the result will not be uniform. The technic adopted must, as a rule, be purely individual, depending first upon the case and secondly upon the supply of radium and how it is preserved. The ideal method would be to employ the emanation, as the size, shape and dosage could be considered for each individual case. Unfortunately, under present conditions, every operator is limited to a small supply of the element, and ideal methods cannot be employed until some large organization shall control the supply."

"Selection of the cases.—So far as true nevi are concerned, the best results are to be expected in the cavernous type where the veins are covered with healthy skin. Among the available methods, the electric needle, galvanism, or diathermy will destroy the enlarged veins without injuring the underlying skin. If, however, the skin is involved and the superficial layer discolored, the application of radium will give the best results. The form of nevi that presents the greatest difficulties both in treatment and cosmetic results is the very superficial and widely disseminated variety and for which radium, high frequency and the ultra-violet light have been employed. The pigmented nevus, unless too deep, will yield most satisfactory results under radiation, either from the roentgen rays or radium. If the area is very extensive, the roentgen ray is attended with some danger from overtreatment of the underlying parts. Where the nevus is thick and leathery, the cosmetic result is questionable. The fact that these nevi are covered with hair does not seem to have any effect upon the result, as several rather extensive areas were treated with perfect success. This is rather a contrast to the thick, leathery variety."

"It may be stated in a general way that radiation offers the best means for the eradication of the more severe types of nevi. The smaller ones may be treated by many other methods with perfect results, but where radiation is selected, caution must be observed, especially in cases where other means have been previously employed. The scar tissue produced by caustics and similar methods depending upon cauterization is extremely sensitive to radiation. At times, ulceration is difficult to avoid and the results under such circumstances are extremely poor.

"In conclusion it may be stated that:

(1) There is no ideal method for the treatment of "birth-marks."

(2) While certain methods are better adapted to certain classes of these "mark," the results obtained depend largely upon the experience of the operator and his control of them.

(3) Any form of radiation employed in the treatment of these "marks" is attended with some risk.

(4) Whatever method is selected or employed, the first application should not be exaggerated. It is easy to repeat the process, but hard to remove the scars.

(5) Consideration must always be given to the trophic influence, which differs in proportion to the size and depth of these vessels, and is difficult to control.

(6) The earlier in infancy some form of treatment is adopted, the better will be the result, as involution will often continue when once a retrograde process is started, until the whole "mark" disappears."

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D. C. Moriarta, Ph. G., M. D., F. A. C. S., (Saratoga Springs, N. Y.) Radium—A Palliative. The American Journal of Obstetrics, Vol. LXXV., No. 469, pp. 21-27, January, 1917. Read before the Twenty-ninth Annual Meeting of the American Association of Obstetricians and Gynecologists at Indianapolis, Ind., September, 1916.

"I have for your discussion a limited experience with a small amount of radium in the relief of distressing symptoms in hopeless, malignant conditions of the female breast and pelvis. I have not a cure in mind, or even a prolongation of life, but simply relief of the symptoms. I have no apology to make for bringing before you a subject with which you, as teachers, operators and clinicians, are familiar; for I believe that these patients ordinarily receive very little consideration, after their condition is pronounced hopeless; and such patients are always in a most deplorable state, mentally, physically and socially."

"The treatment of these conditions is to use opium in quantities sufficient to relieve the pain, while the obnoxious odor and acrid secretions remain uncontrolled. The profession is either skeptical, indifferent, or uninformed, as to the fact that radium is the one remedial agent that may relieve all these symptoms. While you are aware of what radium does, perhaps you have not realized, or appreciated, its clinical value in this field."

"Pain is always present, requiring constantly increasing doses of narcotics. After radium has been used, the pain is materially relieved, and there is, moreover, a willingness on the part of the patient to omit the use of the opiate; at least this has been my experience and, I notice from the literature, it has also been the experience of others."

"Radium also possesses the power to correct the disagreeable odor which accompanies the breaking down of cancerous tissue. This is a very great boon to the patient, as well as to the household. Further, radium controls hemorrhage."

"It is not my purpose to speak of the history or physical properties of radium, or how it acts. I am like other workers of limited experience with radium in that I have only my own clinical observations and deductions to give you. With your indulgence, I present, briefly, a few histories."

"Case I.—Miss B., aet. forty, had her left breast amputated for carcinoma by a most competent surgeon; later he operated several times for the removal of postoperative nodules which continued to reappear. She was finally told that he could do no more for her, and that her

only hope lay in the use of the x-ray. She had received twenty-eight x-ray treatments when she came under my observation, and, she reported, without appreciable betterment. No promise was held out to her, but that I would be glad to try radium. She was greatly emaciated, in constant pain, taking opiates continuously; she was, indeed, a nervous and mental wreck, and without relief, she could not live long. There were many nodes present in the field of operation, varying in size from large pea to pigeon egg; in addition, the entire incision was greatly indurated. She went at once to the hospital, and twenty-five milligrams of radium element was used continuously for 4000 milligram hours. She returned two weeks later, but she had been burned so severely during the first application that I could not treat her at this time. She was very cheerful and happy, however, as the nodes had diminished in size and some had entirely disappeared. The pain had ceased, and she had discontinued her opiates. The burns healed in about a month. I have treated her for the past year, once in four weeks, for 1500 milligram hours. The nodes have entirely disappeared, she has gained in weight, is free from pain, and is both cheerful and hopeful."

"Case II.—Mrs. C., aet. fifty, came into my service at the hospital. She was an emaciated, worn out, nervous woman, who had a huge malignant breast that had already commenced to break down; the axilla was full of palpable glands. This poor creature had kept her secret and worked daily for months, when the pain, odor and discharge compelled her to abandon her work. Surgery alone could promise nothing. After consulting with my colleagues, we amputated the sloughing mass cleaned out the axilla, and buried twenty-five milligrams of radium element in the wound for 2400 milligram hours; and then used it externally continuously for 9600 milligram hours, moving it over the entire area. The pain stopped almost immediately. The wound has healed and she is very comfortable. And so far—only six months, however, there is no evidence of a return."

"Case III.—Mrs. A., aet. eighty. This old lady had no doctor. She was sure she had a cancer, and that she was going to die with it. She suffered much and had taken paragoric for months. The odor was unbearable, and it was for this she consulted a physician. Upon examination I found the pelvis a solid mass; bladder, vagina and rectal walls all being involved. I used twenty-five milligrams of radium element for 250 milligram hours in the vagina, and 250 milligram hours in the rectum the following day. She would not allow me to treat her thereafter. The pain left her within forty-eight hours, and the paregoric was discontinued. The odor diminished within ninty-six hours to such an extent that her family could be in her room, which previously was impossible. She lived about six weeks from the time I first saw her."

"Case IV.—Mrs. S., aet. sixty, came to me with the diagnosis of cancer. She had refused operation, and desired to have the radium treatment. On examination a very large cauliflower-like growth was found in the vault of the vagina. The cervix uteri could not be detected. This patient had been very stout, lost much weight, was very weak, in constant pain, and complained of a foul acrid discharge. After three applications of twenty-five milligrams of radium element for 2400 milligram hours at each treatment, at intervals of three weeks, the vaginal growth, pain and discharge had disappeared."

"Case V.—Mrs. S., housewife, aet, fifty-one, was referred to me for a hysterectomy, on account of continuous hemorrhage for over a year. All treatments resorted to had been without avail. The patient lost 30 pounds in weight, was practically exsanguinated, and edematous. Hemoglobin index 40; red blood count 3,600,000; albumin and casts in the urine. She was a grave surgical risk. I could not discover any growth."

"The use of radium was suggested and accepted. Twenty-five milligrams of radium element were placed in the uterus for 100 milligram hours daily for six days; after two weeks, a similar series of treatments were given. The hemorrhage ceased on the fourth day after the first treatment, but reappeared sixteen months later. The radium was again used as before, 100 milligram hours for three days, when the hemorrhage ceased. Four months have elapsed since the second treatment was given without further loss of blood."

"Case VI.—Mrs. X., aet. fifty-six. Panhysterectomy two and one-half years previously. Complete recovery, and well for two years after. For the last six months she has had a bloody discharge from the vagina. She kept this condition from her family until the constant pain and bad odor compelled her to seek relief. A digital examination of the vagina proved impossible on account of the presence of a cauliflower-like growth. There was a profuse, bloody, purulent discharge of a vile odor. The pain was constant, loss of flesh pronounced and she was very weak. Twenty-five milligrams of radium element were used in the vagina for 2100 milligram hours. At the end of two weeks she returned for a second treatment. At this time the pain was gone, the odor much lessened, and it was possible to examine the vagina. Two more treatments of the same quantity of radium were employed at the same intervals. When she returned after the fourth treatment, all symptoms had disappeared and the vaginal growth was gone."

"A synopsis of these cases shows that pain was relieved; that odor was markedly controlled; that hemorrhage had ceased; and that there was a change in or a disappearance of the local pathological tissues. Two patients died in coma two months after the treatment. Four are alive and hopeful. In Case V, the uterine hemorrhage was not of cancerous origin, but the condition was a terminal one. I am sure the patient would have died had it not been for the use of radium."

"These few cases are not sufficient to draw definite conclusions. But nearly every worker with radium makes the same statements concerning its value in the relief of pain, hemorrhage and odor, but without emphasis in relation to its use in this particular field. In calling your attention to these cases, I cannot but feel that the results I have observed are more than merely accidental."

"In using radium in these cases I believe it is possible to produce a toxemia which may prove fatal. I have seen the end hastened in this way. I would suggest two precautions when applying radium locally; *first*, a patient with a low leukocyte count should not be given prolonged applications of radium; and, *second*, when radium is used, it should be accompanied by the liberal administration of alkalies."

"Finally, I wish to emphasize as my conviction, that no case of this type is so desperate, and no postoperative condition so hopeless, that radium should not be used with an expectation of the alleviation of the distressing symptoms."

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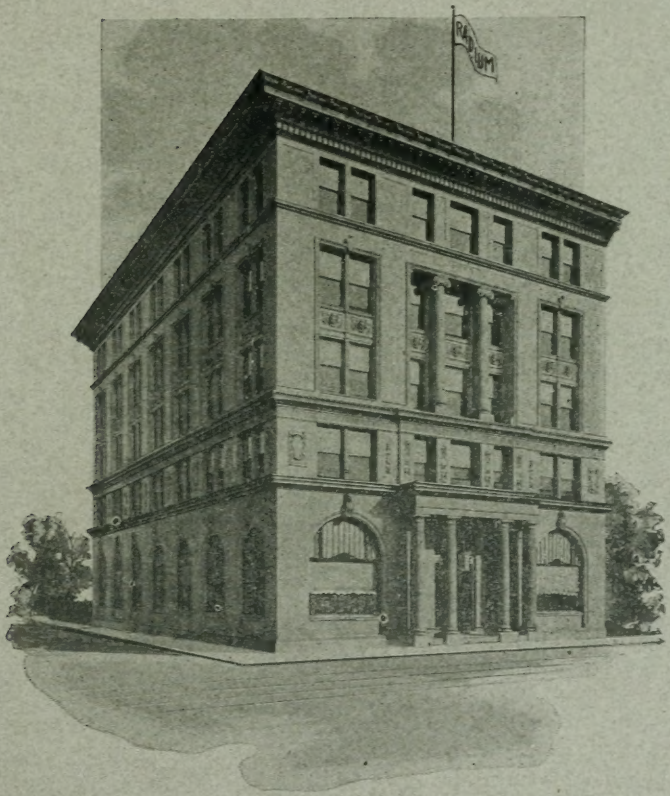

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